CLAIMS

What is claimed is:

1. An integrated catalytic converter/flexible endcone assembly, comprising:

a flexible endcone assembly comprising a flexible bellow having a plurality of undulating ribs concentrically radiating outward from an inlet to a periphery; and

a catalytic converter in physical contact and fluid communication with said periphery, wherein said catalytic converter comprises a shell concentrically disposed about a mat material which is concentrically disposed about a catalyst substrate comprising a catalyst.

2. The integrated catalytic converter/flexible endcone assembly recited in Claim 1, wherein said periphery further comprises a plurality of interface points comprising a joint configuration selected from the group consisting of a lap joint, butt joint, tee joint, and combinations comprising at least one of the following joints.

3. The integrated catalytic converter/flexible endcone assembly recited in Claim 2, wherein said catalytic converter is sealingly secured to said periphery at said plurality of interface points.

4. The integrated catalytic converter/flexible endcone assembly recited in Claim 1, wherein said inlet further comprises a cylindrical portion extending from said plurality of ribs in a direction opposite said catalytic converter.

5. The integrated catalytic converter/flexible endcone assembly recited in Claim 1, further comprising a mounting flange with at least one securement member selected from the group consisting of a stud, screw, clamp, weld, bracket, and combinations comprising at least one of the foregoing securement members, wherein said mounting flange is rotatably attached to said inlet.

6. The integrated catalytic converter/flexible endcone assembly recited in Claim 1, wherein said endcone assembly is capable of moving rotationally about an axis concentrically disposed through said inlet.

7. The integrated catalytic converter/flexible endcone assembly recited in Claim 1, wherein said endcone assembly is capable of moving linearly along an axis concentrically disposed through said inlet.

8. The integrated catalytic converter/flexible coupling assembly recited in Claim 1, wherein said catalytic converter further comprises a member selected from the group consisting of an endplate, an endcone, and a second flexible endcone, concentrically disposed about an opposite end of said shell, and connecting said catalytic converter to an exhaust system component.

9. A method for manufacturing an integrated catalytic converter/flexible endcone assembly, comprising:

forming a catalyst substrate comprising a catalyst;

disposing said catalyst substrate concentrically within a shell an opening;

disposing a mat support material concentrically in between said catalyst substrate and said shell; and

securing said catalytic converter to a periphery of a flexible endcone assembly such that said flexible endcone assembly and said catalytic converter are in physical contact and fluid communication, wherein said flexible endcone assembly comprises a flexible bellow with a plurality of undulating ribs concentrically radiating outward from an inlet to said periphery.

10. The method recited in Claim 9, further comprising securing said catalytic converter to said periphery at a plurality of interface points.

11. The method recited in Claim 10, further comprising using a bond selected from the group consisting of a weld, crimp, lock seam, sealant, and combinations comprising at least one of the foregoing bonds.

12. A method for treating exhaust gas, comprising:

introducing exhaust gas to a converter assembly comprising a flexible bellow comprising a plurality of undulating ribs concentrically radiating outward from an inlet to a periphery, and a catalytic converter in physical contact with said periphery and in fluid communication with said converter assembly, wherein the catalytic converter comprises a shell concentrically disposed about a mat support material which is concentrically disposed about a catalyst substrate comprising a catalyst;

passing the exhaust gas through said converter assembly and through said catalytic converter; and

catalytically treating one or more constituents in the exhaust gas.

13. The method recited in Claim 12, further comprising moving said converter assembly in a first linear direction to adsorb vibration.

14. The method recited in Claim 13, further comprising increasing a resting length of the converter assembly, wherein a distance between said catalytic converter and an exhaust system similarly increases.

15. The method recited in Claim 14, further comprising moving said converter assembly in a second linear direction wherein the resting length of the converter assembly decreases, and the distance between the catalytic converter and an exhaust system similarly decreases.

16. The method recited in Claim 12, further comprising rotating said converter assembly.

17. The method recited in Claim 16, wherein said rotating further comprises rotating said converter assembly in a clockwise direction, a counter-clockwise direction, or a combination thereof.

18. The method recited in Claim 17, wherein said rotating further comprises rotating said converter assembly clockwise up to about 10 degrees.

19. The method recited in Claim 18, wherein said rotating further comprises rotating said converter assembly counter-clockwise up to about 10 degrees.